UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,994	12/18/2000	Mikael Bisgaard-Bohr	9684	4293

26890 7590 05/28/2008

JAMES M. STOVER
TERADATA CORPORATION
2835 MIAMI VILLAGE DRIVE
MIAMISBURG, OH 45342

EXAMINER	
NGUYEN, CINDY	
ART UNIT	PAPER NUMBER
2161	

MAIL DATE	DELIVERY MODE
05/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/739,994
Filing Date: December 18, 2000
Appellant(s): BISGAARD-BOHR ET AL.

James M. Stover
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 03/17/08 appealing from the Office action mailed 09/07/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(4) Status of Amendments After Final

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6301575	Chadha et al.	10-2001
6263337	Fayyad et al.	07-2001

Bruce Moxon, "Data Mining: the Golden Promise," copyright 1997, Miller Freeman, Inc.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Response to Arguments

Applicant's arguments, with respect to *Claim Rejections - 35 USC § 101* have been fully considered and are persuasive. The rejection has been withdrawn.

Applicant's arguments have been fully considered but they are not persuasive. Applicant argued that non of the cited references teaches " a basket database table that contains summary information about the retail transaction data, a department database table that contains aggregate information about the retail transactional data, or a data model mapped to aggregate the transactional data for cluster analysis of shopping behavior. In response, Chadha discloses: a basket database table that contains summary information about the retain transaction data such as the mining data was drawn from sales data of a retail store chain, which transactions drawn over various periods of time. The data has an average of 12 items per sale as summary information about transactional data, col. 15, lines 21-29, Chadha), Chadha also discloses: a department database table that contains aggregate information about the retail transactional data such as (i.e. obtain candidate itemsets (item information) of data from the multi-column data store, each itemset being a combination of a number of rows of the multi-column data store, col. 10, lines 48 to col. 11, line 10, Chadha).

In addition, Bruce discloses a data model mapped to aggregate the transactional data for cluster analysis of shopping behavior such as. as matching algorithms are used in data mining system to determine the key relationships in the data, the models are used develop predictive classifiers as shopping trend, behavior, etc... page 3, last line to page 4, line 3 and fig. 3 on page 4. Bruce also discloses: a shopping related data e.g., retail transactional data, itemdata, department data are stored in tables in relational database. A data model associated/maps various data to find a shopping pattern in relational databases table are used to store data.

Further in page 5, Bruce discloses market-basket analysis, classic market-basket analysis treats the purchase of a number of items (the contents of a market shopping basket) as a single transaction, the desire is to find sets of items that are frequently purchased together, in order to understand and exploit natural buying patterns (shopping pattern), and all transactions are cluster of shopping transaction, see paragraphs 1 and 3, page 5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 6-9, 14-17, 19, 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chadha et al. (US 6301575) (hereafter Chadha) in view of Bruce Moxon, "Data mining: the Golden Promise", Copyright 1997 Miller Freeman, Inc. (hereafter Bruce).

Regarding claim 1, Chadha disclose: a computer-implemented data mining system comprising: (124, fig. 1 and corresponding text, Chadha) comprising:

a relational database managed by a relational database management system for storing retail transaction data (col. 5, lines 15-16, Chadha).

a data model that defines the manner in which said retail transaction data is stored and organized within said relational database said data model (i.e. a physical data model for association is typically organized in a schema of the form of a transaction identifier and an item transaction-id, item-id), hereafter referred to as a SC data mode, col. 8, lines 15-33, Chadha), said data model comprising:

a basket database table that contains summary information about the transactional data (i.e. as the mining data was drawn from sales data of a retail store chain, which transactions drawn over various periods of time. The data has an average of 12 items per sale as summary information about transactional data, col. 15, lines 21-29, Chadha), an item database table that contains information about individual items referenced in the transactional data (i.e. as the multiple column model (of the table), for example, for transaction-1, if three items was purchased, the MC data model would show as transaction-1 Item-1, Item-2, Item-3, col. 8, lines 53-60), a department database table that contains aggregate information about the transactional data (i.e.

obtain candidate itemsets (item information) of data from the multi-column data store, each itemset being a combination of a number of rows of the multi-column data store, col. 10, lines 48-55, Chadha)[1].

However, Chadha didn't disclose: the data model is mapped to aggregate the transactional data for cluster analysis of shopping behavior. On the other hand, Bruce discloses: the data model is mapped to aggregate the transactional data for cluster analysis of shopping behavior (i.e. as matching algorithms are used in data mining system to determine the key relationships in the data, the models are used develop predictive classifiers as shopping trend, behavior, etc… page 3, last line to page 4, line 3 and fig. 3 on page 4, Bruce). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include data model is mapped to aggregate the transactional data for cluster analysis of shopping behavior in the combination system of Chadha as taught by Bruce. The motivation being to enable the data mining system provided these discovery-based techniques to develop models that expose fundamental interrelationships found in the data and capable of examining numerous multidimensional data relationships, example in the retail industry, they are used to analyze the purchase of goods and to develop targeted marketing campaigns (page 5, 2nd paragraph, Bruce).

In addition, Chadha/Bruce discloses wherein the data model is accessed from a relational database managed by a relational database management system (col. 5, lines 15-16, Chadha).

---

[1] Shopping related data e.g., retail transaction, itemdata, department data are stored in tables in relational

Wherein the cluster analysis groups the transactional data into coherent groups according to perceived similarities in the transactional data (i.e. as clustering is used to identifies groups of closely related records that you can use as a starting point for exploring further relationships of interest, page 5, 7th paragraph, lines 1-3 , Bruce). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include cluster analysis groups the retail transaction data in the combination system of Chadha as taught by Bruce. The motivation being to enable the process is performed by clustering algorithms that identify the distinguishing characteristics of the dataset , with clustering, users do not need to identify the groupings desired or the attributes needed to segment the dataset, see page 5, paragraph 6, Bruce.

Regarding claim 9, Chadha disclose: a method, , for analyzing retail transactional data (analysis of market-basket data, col. 8, line 66, Chadha) in a computer-implemented data mining system (124, fig. 1 and corresponding text, Chadha) comprising:

Maintaining a relational database managed by a relational database management system for storing retail transaction data (col. 5, lines 15-16, Chadha).

generating a data structure (col. 8, lines 19-21) in the computer-implemented data mining system (124, fig. 1 and corresponding text, Chadha), wherein is a data

---

database 116, fig. 1. a data model associated/maps various data to find a shopping pattern in relational

model (physical data model, col. 8, lines 15, Chadha) that defines the manner in which said retail transaction data is stored and organized within said relational database said data model (i.e. a physical data model for association is typically organized in a schema of the form of a transaction identifier and an item transaction-id, item-id), hereafter referred to as a SC data mode, col. 8, lines 15-33, Chadha), said data model comprising: a basket database table that contains summary information about the transactional data (i.e. as the mining data was drawn from sales data of a retail store chain, which transactions drawn over various periods of time. The data has an average of 12 items per sale as summary information about transactional data, col. 15, lines 21-29, Chadha), an item database table that contains information about individual items referenced in the transactional data (i.e. as the multiple column model (of the table), for example, for transaction-1, if three items was purchased, the MC data model would show as transaction-1 Item-1, Item-2, Item-3, col. 8, lines 53-60), a department database table that contains aggregate information about the transactional data (i.e. obtain candidate itemsets (item information) of data from the multi-column data store, each itemset being a combination of a number of rows of the multi-column data store, col. 10, lines 48-55, Chadha);

Mapping the data model to aggregate the transactional data for cluster analysis of shopping behavior (i.e. as matching algorithms are used in data mining system to determine the key relationships in the data, the models are used develop predictive classifiers as shopping trend, behavior, etc… page 3, last line to page 4, line 3 and fig. 3

---

database tables are used to store data.

on page 4, Bruce). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include data model is mapped to aggregate the transactional data for cluster analysis of shopping behavior in the combination system of Chadha as taught by Bruce. The motivation being to enable the data mining system provided these discovery-based techniques to develop models that expose fundamental interrelationships found in the data and capable of examining numerous multidimensional data relationships, example in the retail industry, they are used to analyze the purchase of goods and to develop targeted marketing campaigns (page 5, 2nd paragraph, Bruce).

In addition, Chadha/Bruce discloses performing cluster analysis to group said retail transactional data into coherent groups according to perceived similarities in the retail transaction data and presenting the results of the said cluster analysis to a user (i.e., discovered relationships in terms of confidence-rated rules, such as “80 percent of all transaction in which beer was purchased also included potato chip… all transactions are cluster of shopping transaction, and the assignment of records with a large number of attributes into a relatively small set of groups or “segments” by clustering algorithms that identify the distinguishing characteristics of the data set, see page 5, paragraphs 3 and 6). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include cluster analysis groups the retail transaction data in the combination system of Chadha as taught by Bruce. The motivation being to enable the process is performed by clustering algorithms that identify the distinguishing characteristics of the dataset , with clustering, users do not need to identify the

groupings desired or the attributes needed to segment the dataset, see page 5, paragraph 6, Bruce.

Regarding claim 17, Chadha disclose: an apparatus for analyzing retail transactional data (analysis of market-basket data, col. 8, line 66, Chadha) in a computer-implemented data mining system (124, fig. 1 and corresponding text, Chadha) comprising:

a relational database managed by a relational database management system for storing retail transaction data (col. 5, lines 15-16, Chadha).

means for generating a data structure (col. 8, lines 19-21) in the computer-implemented data mining system (124, fig. 1 and corresponding text, Chadha) means for generating a data structure is a data model that defines the manner in which said retail transaction data is stored and organized within said data mining system said data model (i.e. a physical data model for association is typically organized in a schema of the form of a transaction identifier and an item transaction-id, item-id), hereafter referred to as a SC data mode, col. 8, lines 15-33, Chadha), said data model comprising: a basket database table that contains summary information about the transactional data (i.e. as the mining data was drawn from sales data of a retail store chain, which transactions drawn over various periods of time. The data has an average of 12 items per sale as summary information about transactional data, col. 15, lines 21-29, Chadha), an item database table that contains information about individual items

referenced in the transactional data (i.e. as the multiple column model (of the table), for example, for transaction-1, if three items was purchased, the MC data model would show as transaction-1 Item-1, Item-2, Item-3, col. 8, lines 53-60), a department database table that contains aggregate information about the transactional data (i.e. obtain candidate itemsets (item information) of data from the multi-column data store, each itemset being a combination of a number of rows of the multi-column data store, col. 10, lines 48-55, Chadha)

Means for mapping the data model to aggregate the transactional data for cluster analysis of shopping behavior (i.e. as matching algorithms are used in data mining system to determine the key relationships in the data, the models are used develop predictive classifiers as shopping trend, behavior, etc… page 3, last line to page 4, line 3 and fig. 3 on page 4, Bruce). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include data model is mapped to aggregate the transactional data for cluster analysis of shopping behavior in the combination system of Chadha as taught by Bruce. The motivation being to enable the data mining system provided these discovery-based techniques to develop models that expose fundamental interrelationships found in the data and capable of examining numerous multidimensional data relationships, example in the retail industry, they are used to analyze the purchase of goods and to develop targeted marketing campaigns (page 5, 2nd paragraph, Bruce).

In addition, Chadha/Bruce discloses performing cluster analysis to group said retail transactional data into coherent groups according to perceived similarities in the

retail transaction data and presenting the results of the said cluster analysis to a user (i.e., discovered relationships in terms of confidence-rated rules, such as “80 percent of all transaction in which beer was purchased also included potato chip… all transactions are cluster of shopping transaction, and the assignment of records with a large number of attributes into a relatively small set of groups or “segments” by clustering algorithms that identify the distinguishing characteristics of the data set, see page 5, paragraphs 3 and 6). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include cluster analysis groups the retail transaction data in the combination system of Chadha as taught by Bruce. The motivation being to enable the process is performed by clustering algorithms that identify the distinguishing characteristics of the dataset , with clustering, users do not need to identify the groupings desired or the attributes needed to segment the dataset, see page 5, paragraph 6, Bruce.

Regarding claims 6, 14 and 22, all the limitations of these claims have been noted in the rejection of claims 1, 9 and 17, respectively. In addition, Chadha/Bruce discloses: wherein the data model is mapped into a single flat table format to produce a correct level of aggregation for statistical analysis (i.e. the transaction-id value would be repeated for every item bought in that transaction, col. 8, lines 20-33, Chadha).

Regarding claims 7, 15 and 23, all the limitations of these claims have been noted in the rejection of claims 1, 9 and 17, respectively. In addition, Chadha/Bruce disclose: wherein the data model is mapped into a database view to produce a correct

level of aggregation for statistical analysis (i.e. as classic market-basket analysis treats the purchase of a number of items as a single transaction. The desire is to find sets of items that are frequently purchased together in order to understand and exploit natural buying patterns, page 5, 1st paragraph, Bruce).

Regarding claims 8, 16 and 24, all the limitations of these claims have been noted in the rejection of claims 1, 9 and 17 above, respectively. In addition, Chadha/Bruce discloses: wherein the data model is comprised of one row per transaction in the transactional data (i.e. as in single column data model, the transaction-id value would be repeated for every item bought in that transaction, col. 8, lines 20-36, Chadha).

Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chadha et al. (US 6301575) (hereafter Chadha) in view of Bruce Moxon, "Data mining: the Golden Promise", Copyright 1997 Miller Freeman, Inc. (hereafter Bruce) and further in view of Fayyad et al. (US 6263337).

Regarding claims 25-27, all the limitations of these claims have been noted in the rejection of claims 1, 9 and 17, respectively. In addition, Chadha/Bruce didn't disclose: wherein the cluster analysis utilizes a Gaussian Mixture Model. On the other hand, Fayyad discloses: wherein the cluster analysis utilizes a Gaussian Mixture Model (120, fig. 4 and corresponding text and col. 9, lines 22-67, Fayyad). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include the cluster analysis utilizes a Gaussian Mixture Model in the combination

system of Chadha/Bruce as taught by Fayyad. The motivation being to enable the system to process using Gaussian mixture model for better clustering by applied to a mixture of Gaussians justified criteria for deciding which data can be summarized.

(10) Response to Argument

The rejection of claims 1, 6-9, 14-17 and 22-27 under 35 U.S.C. §103(a) are proper.

A proper rejection under 35 U.S.C. §103(a) requires that a prima facie case of obviousness, at least the following requirements must be met: (1) the references when combined must teach or suggest all elements of the claimed subject matter; (2) there must be some motivation, suggestion or teaching to combine the references; and (3) there must be, within the references, a reasonable expectation of success. See M.P.E.P.§ 2143 (8th ed., Rev. 2), at 2100-129. the discussion below will show that all three criteria are fully satisfied.

In the rejection of independent claims 1, 9, and 17, Appellant alleges that none of the cited references teaches "a basket database table that contains summary information about the retail transactional data", "a department database table that contains aggregate information about the retail transactional data" or a data model mapped "to aggregate the transactional data for cluster analysis of shopping behavior" (Brief page 8). These arguments are addressed below in turn.

The Examiner respectfully disagrees, in Chadha's relational database system (col. 5, lines 15) provides a data mining system 124 have physical data model for the

input data, the data for association is typically organized in a schema of the form of transaction identifier and an item (transaction-id, item-id), the data model provided market basket data table provided associations the retail sales summary data together in a transaction (col. 8, lines 50-60) for example if three items were purchased the MC data model would show the total items in the table (col. 8, line 60), Chadha's data model also show information about individual items in the retail transaction data such as each item was purchased associated with that transaction-id, item-id and data miming system performs a combination operator to obtain candidate itemsets of data from the multi-column data store, each itemssets of data being a combination (aggregate) of the number of rows of the multi-column data store (col. 10, lines 51-55), Chadha grouping items by transaction identifier in each row (col. 13, lines 52-54) and gather information about the retail items sold in the transaction (col. 8, lines 25-38).

In addition, Bruce discloses a data model mapped to aggregate the transactional data for cluster analysis of shopping behavior such as. as matching algorithms are used in data mining system to determine the key relationships in the data, the models are used develop predictive classifiers as shopping trend, behavior, etc.., page 3, last line to page 4, line 3 and fig. 3 on page 4. Bruce also analyze the purchase of goods in order to develop targeted marketing and market basket analysis deals with a collection of items as part of a point in time transaction see page 5, paragraphs 1-4. It would have been obvious to a person of ordinary skill in the art to include data model is mapped to aggregate the transactional data for cluster analysis of shopping behavior in the combination system of Chadha as taught by Bruce. The motivation being to enable the

data mining system provided these discovery-based techniques to develop models that expose fundamental interrelationships found in the data and capable of examining numerous multidimensional data relationships, example in the retail industry, they are used to analyze the purchase of goods and to develop targeted marketing campaigns (page 5, 2nd paragraph, Bruce).

The claims were rejected under 35 U.S.C. 103(a) as being obvious over Chadha and Bruce. As noted above, three criteria must be satisfied in order to establish a prima facie case of obviousness. Here, Chadha and Bruce in combination disclose all the limitations of claim 1. There is a reasonable expectation of success in combining Chadha and Bruce because they both are directed to data mining . Lastly, there is a motivation to combine found in Bruce and in knowledge commonly available to one of ordinary skill in the art. Therefore, all three criteria for establishing a prima facie case of obviousness are fully satisfied. As a result the rejection of claims 1, 9 and 17 under 35 U.S.C. 103(a) is proper and should be Sustained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Cindy Nguyen

/C. N./

Examiner, Art Unit 2161

Conferees:

/Apu M Mofiz/

Supervisory Patent Examiner, Art Unit 2161

/Hosain T Alam/

Supervisory Patent Examiner, Art Unit 2166